ACRP Problem No. 12-07-05

Aircraft Ramp/Apron Standards

ACRP Staff Comments: The proposed funding level may be low; suggest increasing to $250,000.

TRB Aviation Group Committees Comments: AIRCRAFT/AIRPORT COMPATIBILITY CMTE - The ramp standards are probably due for review now that Group VI aircraft are becoming more commonplace. This effort should expand upon rather than replace AC's 150/5300-13 and 150/5360.

Review Panel Comments: <u>Recommended</u> — This project would provide needed guidance to a broad range of airports.

AOC Disposition: Approved and funded at $250,000. There is a strong need for guidance. The FAA would benefit from this project. Although ACRP is not a "standards-setting" organization, it can develop best practices, working with those who have the authority to set standards. The research should consider common use gates. The title should refer to "recommended practices" instead of "standards." The project panel should have airline representation.

AIRPORT COOPERATIVE RESEARCH PROGRAM

FY2012 PROBLEM STATEMENT

ACRP *Problem Number*: **12-07-05**

I. PROBLEM TITLE

Aircraft Ramp/Apron Standards

II. RESEARCH PROBLEM STATEMENT

Ramps/aprons should be provided where necessary to permit the on- and off-loading of passengers, cargo or mail as well as the servicing of aircraft without interfering with other airport operations.

The Federal Aviation Administration (FAA) is an agency of the United States Department of Transportation with authority to establish policy, regulate and oversee all aspects of civil aviation in the U.S. Most civil aviation policies and regulations are accompanied by Advisory Circulars (better known as ACs) that provide explanatory information and examples of how to comply with the rule. The FAA has published ACs for most aspects related to facilities; however, they do not have an AC or standards for aircraft ramps/aprons.

Ramp/apron standards would aid in the development of efficient and safe ramp areas by taking into consideration the following:

- The movement and physical characteristics of the aircraft to be served,
- The maneuvering, staging, and location of ground service equipment and underground utilities,
- The dimensional relationships of parked aircraft to the terminal building, and
- The safety, security, and operational practices related to ramp/apron control.

III. OBJECTIVE

The objective of this study is to develop a guidebook recommending a set of standards to help plan and design ramp/apron areas at all sized airports. The research will identify and define best practices for ramp/apron standards and markings used by airports to help standardize the look, feel, and safety of ramp/apron areas across the U.S.

The guidebook should focus on the following areas when identifying best ramp/apron standards:

- Clearances to include wingtip clearances and minimum separation between nose of aircraft and buildings,
- Fire access requirements, and
- Ramp markings to include gate markings, road markings, vehicle and equipment parking markings, edge markings, temporary construction markings, deicing markings, markings for remote hardstand pads, and any additional special markings.

The guidebook should focus on the following design characteristics in identifying best practices:

- Flexibility,
- Consistency,
- Efficiency,
- Security,
- Environment,
- Maintenance,
- Safety, and
- Other (as researchers see fit).

IV. RESEARCH PROPOSED

The proposed research should include, but not be limited to the following tasks:

- Conduct a literature review to:
    - Understand ramp/apron operations,
    - Identify ramp/apron best practices used at airports across the world today,
    - Identify any corporate standards used by airlines or other, and

    - Review existing recommended ramp standards published by aviation organizations, such as the International Air Transport Association (IATA), Transport Canada or Airports Council International (ACI).

- Select a representative sample of different sized airports with one or more of the following aircraft operations: unscheduled flights, scheduled flights (both passengers and cargo), and general aviation to include helicopter operations. Contact them to identify their willingness to provide information and/or facilitate data collection.

- Collect and analyze the data.

- Develop a method for evaluating the identified current practices to subsequently recommend best practices and standards for use by public-use airports. New developed standards by the experienced research team can be added to the guidebook as necessary.

- Identify needs for future research.

- Prepare a draft final guidebook of recommended ramp/apron standards and submit it to the Project Panel for review and comment. Revise the report to address Panel concerns and suggestions and submit to ACRP for publication.

V. ESTIMATE OF THE PROBLEM FUNDING AND RESEARCH PERIOD

Suggested funding: It is estimated that the proposed research to prepare a guidebook outlining best ramp standards and markings used by airports would require a funding level of $150,000.

Research period: It is anticipated that the proposed research would require 6 months to complete by a suitably experienced research team, including the final two months for review and revision of the draft final report.

VI. URGENCY AND PAY-OFF POTENTIAL

The Federal Aviation Administration in the Unites States and Transport Canada in Canada, as two examples, regulate the standards for surface markings of runways, taxiways, and movement areas in general. However, they do not have or enforce standards for the ramps/aprons.

Based on discussions with other U.S. airports, a guidebook outlining preferred or recommended ramp/apron standards could help airports create consistent

standards across all airports and therefore eliminate pilot and operator confusion, keep a more cost efficient inventory of resources, and lower incident liability.

VII. RELATED RESEARCH

A literature review by the team has revealed some guidance related to the proposed problem by other aviation agencies. The following are some of the guidebooks the team has reviewed:

Canadian Airports Council (2007). *Apron Marking Manual.* First edition.

International Air Transport Association (IATA) and Airports Council International (ACI) (2001). *Apron Markings & Signs Handbook.*

International Civil Aviation Organization (ICAO) (2004, July). *Aerodromes, Annex 14 to the Convention on International Civil Aviation, Volume I Aerodrome Design and Operations.* Fourth edition.

National Fire Protection Association (NFPA) (2010). *NFPA 407: Standard for Aircraft Fuel Servicing.* Retrieved September 28, 2010, from http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=407&cookie_test=1

National Fire Protection Association (NFPA) (2010). *NFPA 410: Standard on Aircraft Maintenance.* Retrieved September 28, 2010, from http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=410

Federal Aviation Administration (2005, April 29). *Advisory Circular 150/5340-1J, Standards for Airport Markings.*

Federal Aviation Administration (2003, January 17). *Advisory Circular 150/5370-2, Airport Safety During Construction.*

International Fire Code (IFC) (2006). *IFC Chapter 11 – Aviation Facilities.* Retrieved November 10, 2010, from http://ecodes.biz/ecodes_support/free_resources/06NewJerseyFire/fire_code/pdfs//Chapter%2011_Aviation%20Facilities.pdf

International Fire Code (IFC) (2006). *IFC Chapter 5 – City Ordinance.* Retrieved November 10, 2010, from http://www.cityofportsmouth.com/inspection/pdf/INTERNATIONAL-FIRE-CODE-2006.pdf

Federal Aviation Administration (1988, April 22). *Advisory Circular 150/5360-13, Planning and Design Guidelines for Airport Terminal Facilities.*

While there are some incomplete reports outlining preferred ramp standards, research of the guidance shows that each agency has different recommendations. A best practices guidebook including all ramp/apron standards and markings would be very helpful.

VIII. PERSON(S) DEVELOPING THE PROBLEM

Matt Davis, CM; Assistant Director of Planning, City of Atlanta; 1255 South Loop Road, College Park, Georgia 30337; ph: (404) 530-5560; fax: (404) 305-7956

Robert Kennedy, AAE; Interim Deputy General Manager, City of Atlanta; 6000 North Terminal Parkway suite 400, Atlanta, Georgia 30320; ph: (404) 382-2329; fax: (404) 559-2323

Yasmina Platt, CM; Aviation Planner, City of Atlanta; 1255 South Loop Road, College Park, Georgia 30337; ph: (404) 530-5940; fax: (404) 305-1557

IX. PROCESS USED TO DEVELOP RESEARCH STATEMENT

The problem statement was written by the authors and reviewed by several professional sources.

X. DATE AND SUBMITTED BY

Submitted by: Yasmina Platt, CM; Aviation Planner, City of Atlanta; 1255 South Loop Road, College Park, Georgia 30337; ph: (404) 530-5940; fax: (404) 305-1557

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